

REMARKS

Claims 1, 3-6 and 8-10 were examined and reported in the Office Action. Claims 1, 3-6 and 8-10 are rejected. Claims 1 and 6 are amended. Claims 1, 3-6, 8-10 remain.

Applicants request reconsideration of the application in view of the following remarks.

I. 35 U.S.C. § 103(a)

It is asserted in the Office Action that claims 1, 3-6 and 8-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent No. 6,027,833 issued to Ueda et al. ("Ueda") in view of either US Patent No. 5,595,838 issued to Yamada et al. ("Yamada") or US Patent No. 6,337,159 issued to Peled et al. ("Peled"), and in further view of U.S. Patent No. 5,972,537 issued to Mao et al. ("Mao"). Applicants respectfully disagree.

According to MPEP 2142 "[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure." (In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

Applicants' amended claim 1 contains the limitations of "[a] negative active material for a rechargeable lithium battery comprising: a core including crystalline carbon, amorphous carbon or a mixture thereof; and a carbon shell formed around the core, the carbon shell including carbon derived from amorphous carbon and having a semi-crystalline structure and at least one shoulder at 700°C or more without a peak at less than 700°C in differential thermal analysis, and the carbon shell including a metal selected from the group consisting of a transition metal, an alkali metal and an earth metal, wherein the metal is not in a form of a metal compound."

Applicants' amended claim 6 contains the limitations of "[a] negative active material for a rechargeable lithium battery comprising: a core including secondary particles, the secondary particle being prepared by agglomerating at least one primary particle of a crystalline carbon, an amorphous carbon or a mixture thereof; and a carbon shell formed around the core, the carbon shell including carbon derived from amorphous carbon and having a semi-crystalline structure and at least one shoulder at 700°C or more without a peak at less than 700°C in differential thermal analysis, and the carbon shell including a metal selected from the group of consisting of a transition metal, a semi-metal, an alkali metal and an alkali earth metal, wherein the metal is not in a form of a metal compound."

Therefore, Applicants' claimed invention has a carbon shell having a semi-crystalline structure and at least one shoulder at 700°C or more without a peak at less than 700°C in differential thermal analysis, and the carbon shell including a metal selected from the group of consisting of a transition metal, a semi-metal, an alkali metal and an alkali earth metal, wherein the metal is not in a form of a metal compound."

Ueda discloses a non-aqueous electrolyte secondary cell having a core made of crystalline graphite (carbon) structure. Ueda also discloses that a "low crystallinity or amorphous carbon layer 312 at least partially covering the core 311..." (Ueda, column 8, lines 9-13). The carbon shell disclosed in Ueda is not made of a metal. Unlike the carbon shell of Applicant's claimed invention, the carbon shell disclosed in Ueda has a lower crystallinity, i.e. amorphous carbon.

Applicant attaches a graph illustrating the differential thermal analysis result of Ueda. In the graph, MGC-0 indicates only amorphous carbon. MGC-10 indicates a 10 wt% of amorphous carbon shell on 90 wt% of a crystalline carbon core. From the attached graph and from Figure 3, the negative active material of Applicant's claimed invention is clearly distinguishable from Ueda. Moreover, Ueda does not disclose, teach or suggest a "a carbon shell having a semi-crystalline structure and at least one shoulder at 700°C or more without a peak at less than 700°C in differential thermal analysis, and the carbon shell including a metal selected from the group of consisting of

a transition metal, a semi-metal, an alkali metal and an alkali earth metal, wherein the metal is not in a form of a metal compound."

Yamada discloses a non-aqueous secondary battery arranged having "graphite-like planes [] arranged and stacked in an onion-like shell micro-texture ..." (Yamada, column 3, lines 44-49). Yamada further discloses a that the carbon composite electrode includes a crystalline carbon core, a metal film coating the surface of the crystalline carbon core and a carbon layer deposited on the whole surface of the metal film. That is, Yamada discloses a triple layer. Applicant's claimed invention, however, includes a carbon core and shell with carbon having a semi-crystalline structure and a metal. That is, Applicant's claimed invention only includes a double layer. Yamada does not disclose, teach or suggest "a carbon shell having a semi-crystalline structure and at least one shoulder at 700°C or more without a peak at less than 700°C in differential thermal analysis, and the carbon shell including a metal selected from the group of consisting of a transition metal, a semi-metal, an alkali metal and an alkali earth metal, wherein the metal is not in a form of a metal compound."

Peled discloses a non-aqueous electrochemical cell arranged having a synthetic passivating layer (SEI) being made of "MACO₃, M₂ CO₃, alkali semi-carbonates, MAO, M₂ O, MAS, M₂S and alkali-and alkaline-earth metal salts of surface carboxylic groups (M=alkali metal, MA=alkaline earth metal). Distinguishable, Applicant's claimed invention has a carbon shell in the form of a metal whereas Peled discloses alkali semi-carbonates, alkali and alkaline earth metal salts, i.e. metal compounds. Further, Peled does not disclose, teach or suggest a "a carbon shell having a semi-crystalline structure and at least one shoulder at 700°C or more without a peak at less than 700°C in differential thermal analysis, and the carbon shell including a metal selected from the group of consisting of a transition metal, a semi-metal, an alkali metal and an alkali earth metal, wherein the metal is not in a form of a metal compound."

Mao discloses a method of fabricating a carbon material for use as an electrode in an electrochemical cell. Mao discloses that the "carbon materials are substantially amorphous [and they can also be] partially or completely crystalline or amorphous but possessing crystalline inclusions." (Mao, column 3, lines 6-10). Mao, however, does not

teach, disclose or suggest that carbon has a semi-crystalline structure. Further, Mao does not teach, disclose or suggest "a carbon shell having a semi-crystalline structure and at least one shoulder at 700°C or more without a peak at less than 700°C in differential thermal analysis, and the carbon shell including a metal selected from the group of consisting of a transition metal, a semi-metal, an alkali metal and an alkali earth metal, wherein the metal is not in a form of a metal compound."

Therefore, even if the teachings of Ueda, Yamada, Peled and Mao were combined, the resulting invention would still not teach, disclose or suggest "a carbon shell having a semi-crystalline structure and at least one shoulder at 700°C or more without a peak at less than 700°C in differential thermal analysis, and the carbon shell including a metal selected from the group of consisting of a transition metal, a semi-metal, an alkali metal and an alkali earth metal, wherein the metal is not in a form of a metal compound" since neither Ueda, Yamada, Peled, Mao, nor the combination of the four, disclose, teach or suggest all of these limitations. Therefore, there would not be any motivation to arrive at Applicants' claimed invention. Thus, Applicants' amended claims 1 and 6 are not obvious over Ueda in view of either Yamada or Peled, and further in view of Mao since a *prima facie* case of obviousness has not been met under MPEP 2142. Additionally, the claims that directly or indirectly depend from Applicant's amended claims 1 and 6, namely claims 2, and 3-5, and 8-10, respectively, are also not obvious over Ueda in view of either Yamada or Peled, and further in view of Mao for the above same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 1, 3-6 and 8-10 are respectfully requested.

II. Double Patenting

It is asserted in the Office Action that claims 1, 3-6 and 8-10 are rejected under the judicially created doctrine of double patenting over claims 1-7 of U.S. Patent No. 6,395,427 B1 since the pending claims, if allowed would improperly extend the "right to exclude" already granted in each patent. Applicants respectfully disagree.

Applicants note that semi-crystalline carbon shells of U.S. Patent No. 6,355,377 B1 and 6,395,427 B1 have metal boride and metal carbide. That is, metal compounds. A carbon shell, however, as claimed by Applicant is a metal, not a metal compound. Therefore, Applicants respectfully assert that the double patenting rejections are not proper regarding claims 1, 3-6 and 8-10.

Accordingly, withdrawal of the double patenting rejections for claims 1, 3-6 and 8-10 are respectfully requested.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending, namely 1, 3-6, and 8-10, patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

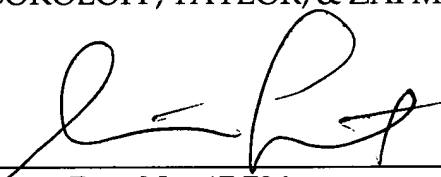
If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

PETITION FOR EXTENSION OF TIME

Per 37 C.F.R. 1.136(a) and in connection with the Office Action mailed on TUESDAY, JANUARY 27, 2004, Applicants respectfully petition Commissioner for a one (1) month extension of time, extending the period for response to THURSDAY, MAY 27, 2004. The Commissioner is hereby authorized to charge payment to Deposit Account No. 02-2666 in the amount of \$110.00 to cover the petition filing fee for a 37 C.F.R. 1.17(a)(1) large entity. A duplicate copy of this sheet is enclosed.

Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR, & ZAFMAN LLP

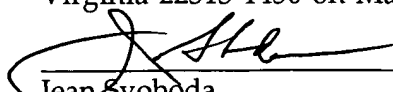
Dated: May 11, 2004

By: 
Steven Laut, Reg. No. 47,736

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, California 90025
(310) 207-3800

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail with sufficient postage in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P. O. Box 1450, Alexandria, Virginia 22313-1450 on May 11, 2004.


Jean Svoboda